Bachelor Thesis

Pathologic Plasticity in Motor Cortex

Goal of this thesis is to develop, implement, and describe a model for cortical plasticity. This will include a comprehensive review of existing work on this topic.

The model to be built will explain how cortical plasticity in motor cortex plays a crucial role in a rare but well documented disease - the trained inability to move two or more fingers separately.

The thesis will contain three main parts:

(i) An introduction to (abstract) modeling of cortical processes. You will reference and introduce milestone results from this area.

(ii) An introduction to the pathological, cortical process we want to understand and a detailed explanation of your model. For every decision you had to make while designing or implementing your model you will discuss the possibilities you had and why you decided to continue in a specific way or the other. If there are valid alternatives you have not looked at you should mention them shortly.

(iii) In addition to the written thesis you will have to implement your model in Python. This implementation will be used by us and others to verify the quality of your results.

Prerequisites: good programming skills, ability to acquire knowledge on your own, interest in brain anatomy and physiology (no preexisting knowledge needed)

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